

LA-UR-21-27803

Approved for public release; distribution is unlimited.

Title: End of Summer Presentation

Author(s): Martinez Sanchez, Diego

Intended for: To keep in my academic portfolio

Issued: 2021-08-04

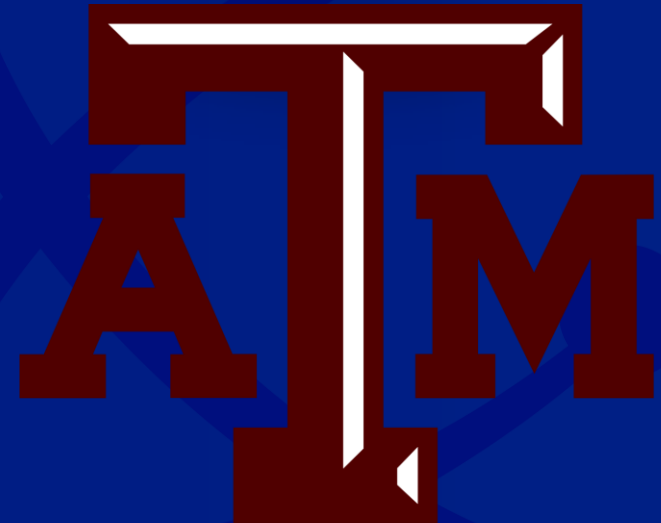
Disclaimer:

Los Alamos National Laboratory, an affirmative action/equal opportunity employer, is operated by Triad National Security, LLC for the National Nuclear Security Administration of U.S. Department of Energy under contract 89233218CNA000001. By approving this article, the publisher recognizes that the U.S. Government retains nonexclusive, royalty-free license to publish or reproduce the published form of this contribution, or to allow others to do so, for U.S. Government purposes. Los Alamos National Laboratory requests that the publisher identify this article as work performed under the auspices of the U.S. Department of Energy. Los Alamos National Laboratory strongly supports academic freedom and a researcher's right to publish; as an institution, however, the Laboratory does not endorse the viewpoint of a publication or guarantee its technical correctness.

End of Summer Presentation Summer 2021

Diego Martinez
August 4th

LA-UR: - pending



Overview

Background

Training

Project

Contributions

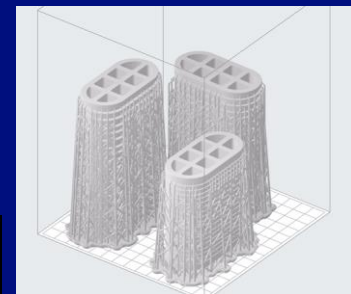
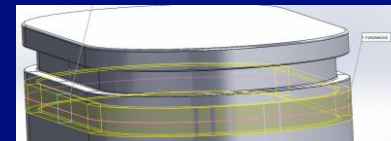
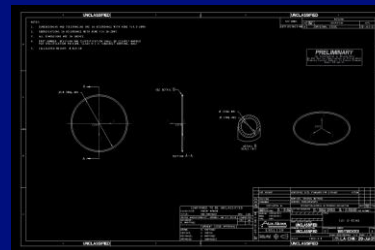
What I
Learned



ptc

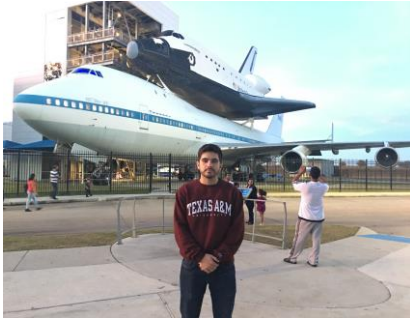


1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	20	0.07	1.004	2.034247518															
2	21	0.07	1.006	3.129202083															
3	22	0.07	1.120	5.10096602															
4	23	0.07	1.191	5.521701885															
5	24	0.07	1.254	5.739645702															
6	25	0.07	1.318	5.914026446															
7	26	0.07	1.379	6.112384784															
8	27	0.07	1.441	6.307212818															
9	28	0.07	1.504	6.500543885															
10	29	0.07	1.620	6.897528617															
11	30	0.07	1.754	7.290462129															
12	31	0.07	1.879	7.68341111															
13	32	0.07	2.004	8.079484922															
14	33	0.07	2.129	8.468519274															
15	34	0.07	2.254	8.861318975															
16	35	0.07	2.379	9.259197417															
17	36	0.07	2.504	9.656103111															



Background

- Originally from Spain
- Lived in England and Mexico
- High school in Houston, Texas



- Interests:
 - Astrophysics
 - Drone cinematography



- Texas A&M – Class of 2022
- Mechanical Engineering

Training



GD&T Levels 1,2 and Advisor



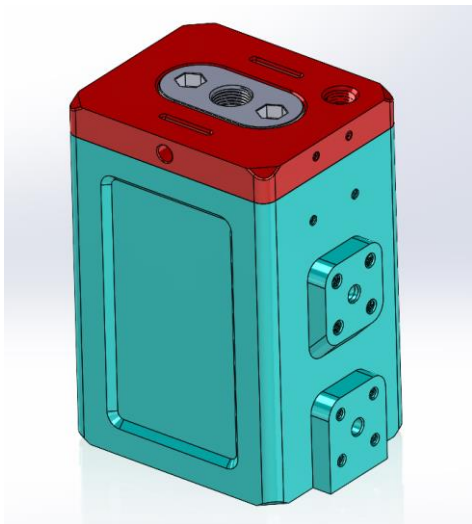
Creo Parametric Fundamentals

Project

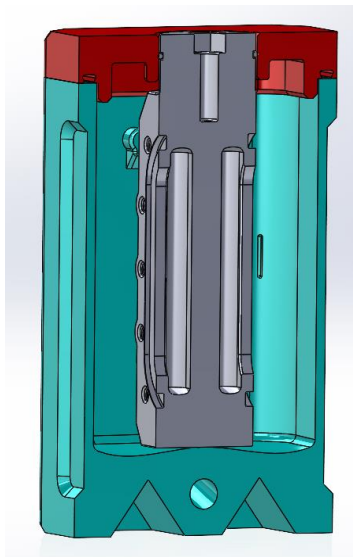
Decontaminating Gloveboxes



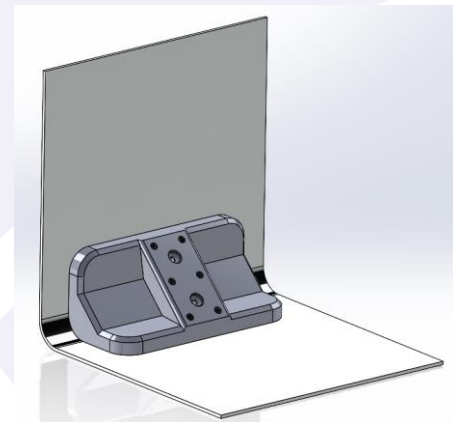
Project



[Electrolytic] Flowcell

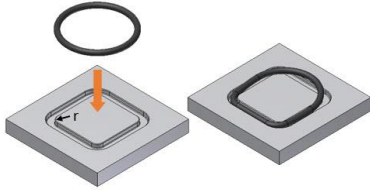


Cathode/Anode

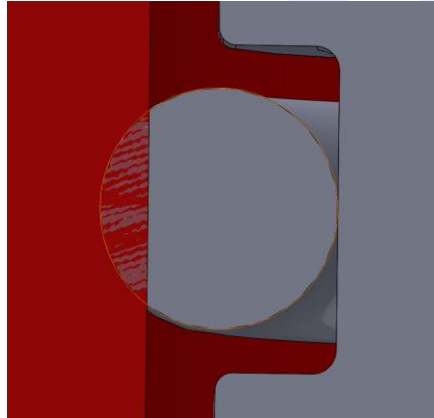
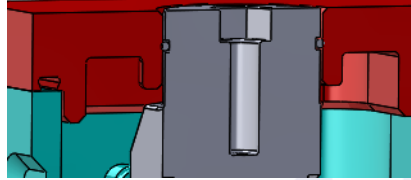


Edge Vacuum Head

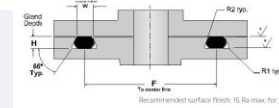
Contributions



Non-circular o-ring groove



Overlap/Squeeze



Recommended surface finish: 16 Ra max. for gases and 32 Ra max. for fluids.

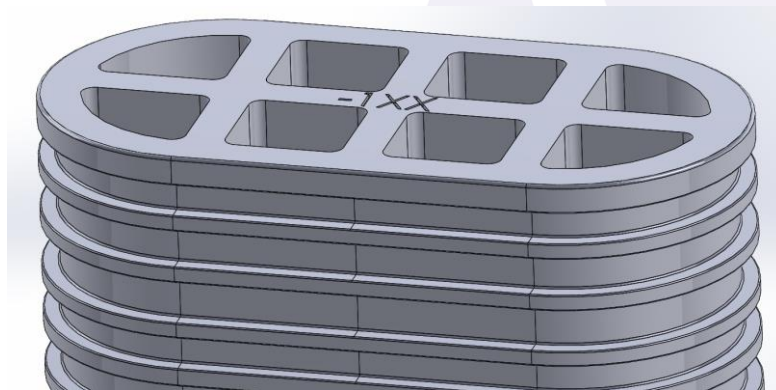
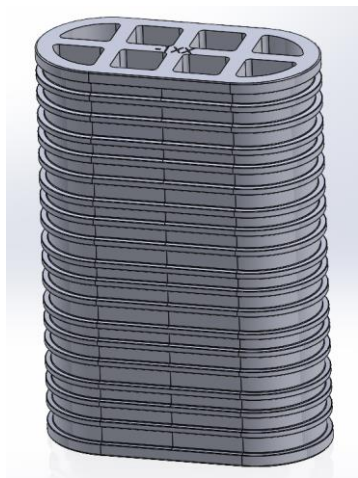
Dovetail Gland and O-Ring Width and Depth Default Recommendations

AS 568A SERIES	O-RING CROSS-SECTION		GLAND WIDTH (W)		GLAND DEPTH (D)		GLAND CORNER RADI	
	MM	TOL. +/-	MM	TOL. +/-	MM	TOL. +/-	(R1)	(R2)
000	0.070	0.003	0.054	0.002	0.052	0.002	0.015	0.005
-100	0.103	0.003	0.088	0.003	0.078	0.003	0.015	0.010
-200	0.139	0.004	0.120	0.003	0.106	0.003	0.031	0.010
-300	0.210	0.005	0.176	0.003	0.164	0.004	0.031	0.015
-400	0.279	0.006	0.235	0.003	0.218	0.004	0.063	0.015

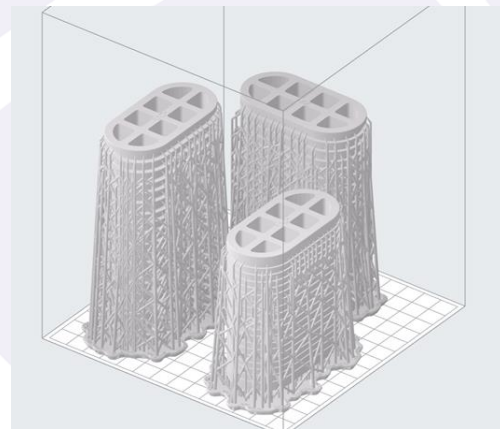
#	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Dash#	Reaction	OD	center circumference			o ring circumference requirement	squeeze		depth	squeeze	o ring off width	
2		20	0.07	1.004	2.934347538	ODX		6.8714508	0	0.0475	0.0025	0.0125	0.0885
3		20	0.07	1.004	2.934347538	1AX		6.872664363	0.002	0.0465	0.0045	0.0105	0.0885
4		21	0.07	1.066	3.129026283	2DX		6.597566039	0.008	0.0435	0.0065	0.0085	0.0905
5		22	0.07	1.129	3.32694662					0.0415	0.0085	0.0065	0.0925
6		23	0.07	1.191	3.521725385					0.0395	0.0105	0.0045	0.0945
7		24	0.07	1.254	3.719645702					0.0375	0.0125	0.0025	0.0965
8		25	0.07	1.316	3.914424446					0.0355	0.0145	0.0005	0.1014
9		26	0.07	1.379	4.112344784					0.0335	0.0165	-0.0015	0.1038
10		27	0.07	1.441	4.307123528					0.0315	0.0185	-0.0035	0.1062
11		28	0.07	1.504	4.502943885					0.0295	0.0205	-0.0055	0.1086
12		29	0.07	1.567	4.697742941					0.0275	0.0225	-0.0075	0.1111
13		30	0.07	1.754	5.290442029					0.0255	0.0245	-0.0095	0.1134
14		31	0.07	1.879	5.68314111								
15		32	0.07	2.004	6.075840192								
16		33	0.07	2.129	6.468539274					0.0655	0.0175	0.014	0.1613
17		34	0.07	2.254	6.861238355					0.0635	0.0195	0.012	0.1654
18		35	0.07	2.379	7.253937437					0.0615	0.0215	0.01	0.1678
19		36	0.07	2.504	7.646636519					0.0595	0.0235	0.008	0.1702
20		37	0.07	2.629	8.039335601					0.0575	0.0255	0.006	0.1726
21		38	0.07	2.754	8.432034682								
22													
23													
24		117	0.103	1.005	2.833756574					0.097	0.022	0.0275	0.2154
25		118	0.103	1.068	3.03169911					0.094	0.025	0.0245	0.219
26		119	0.103	1.13	3.226415605					0.091	0.028	0.0215	0.2226
27		120	0.103	1.193	3.424335992					0.088	0.031	0.0185	0.2262
28		121	0.103	1.255	3.619114737					0.085	0.034	0.0155	0.2298
29		122	0.103	1.318	3.81705074								
30		123	0.103	1.38	4.011813819								
31		124	0.103	1.443	4.209734156								
32		125	0.103	1.505	4.4045129								
33		126	0.103	1.568	4.602431238								
34		127	0.103	1.63	4.797211982								
35		128	0.103	1.693	4.995132319								
36		129	0.103	1.755	5.189911064								
37		130	0.103	1.818	5.387814401								
38		131	0.103	1.88	5.582630145								
39		132	0.103	1.943	5.780530483								
40		133	0.103	2.005	5.975309227								
41		134	0.103	2.068	6.173229564								

Contributions

Testing multiple grooves on a single part

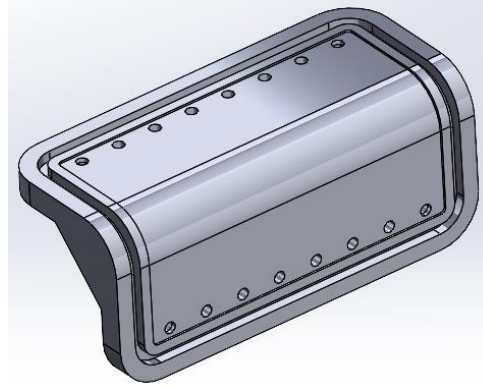
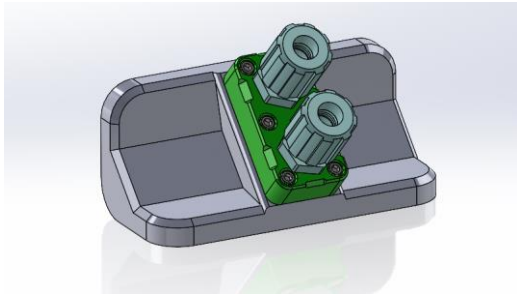


3D printing
prototypes

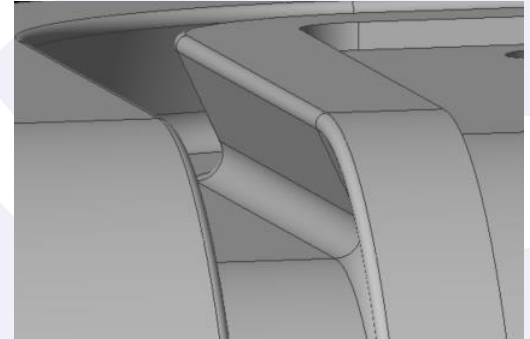


Contributions

90 degree airtight
surface



Dovetail groove

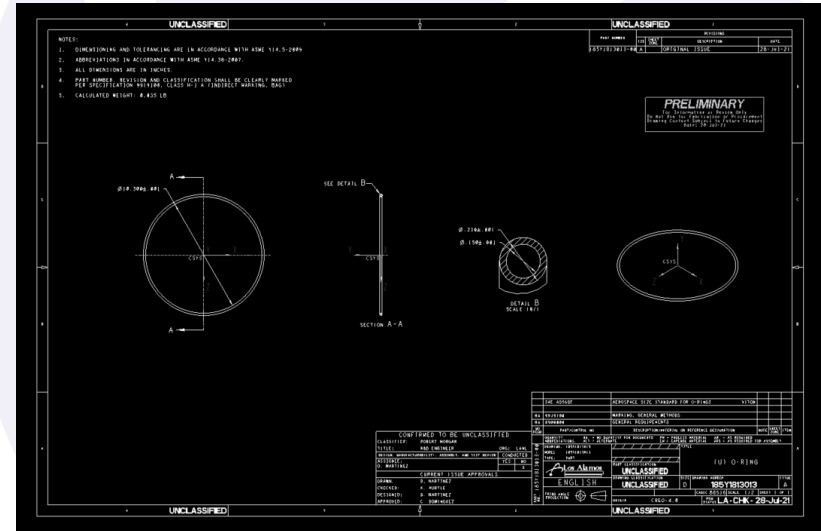


Contributions



Custom rubber
extrusion

Final o-ring technical drawing

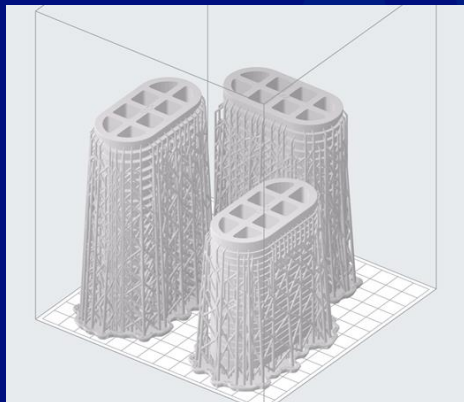
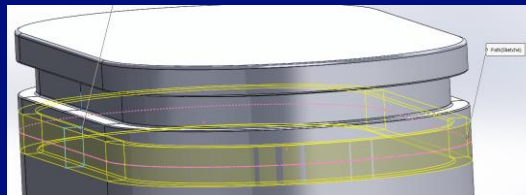




What I learned



- Swept Cut
- Technical Standards
- Excel for CAD
- Manufacturing
- O-Ring Sealing
- Design Meetings
- W-11 Drawing/Windchill



1	Dash#	Xsection	OD	center circumference
2				
3	20	0.07	1.004	2.934247538
4	21	0.07	1.066	3.129026283
5	22	0.07	1.129	3.32694662
6	23	0.07	1.191	3.521725365
7	24	0.07	1.254	3.719645702
8	25	0.07	1.316	3.914424446
9	26	0.07	1.379	4.112344784
10	27	0.07	1.441	4.307123528
11	28	0.07	1.504	4.505043865
12	29	0.07	1.629	4.897742947
13	30	0.07	1.754	5.290442029
14	31	0.07	1.879	5.68314111
15	32	0.07	2.004	6.075840192
16	33	0.07	2.129	6.468539274
17	34	0.07	2.254	6.861238355
18	35	0.07	2.379	7.253937437
19	36	0.07	2.504	7.646636519
20	37	0.07	2.629	8.039335601
21	38	0.07	2.754	8.432034682
22				
23				
24	117	0.103	1.005	2.833716574
25	118	0.103	1.068	3.031636911
26	119	0.103	1.13	3.226415655
27	120	0.103	1.193	3.424335992
28	121	0.103	1.255	3.619114737
29	122	0.103	1.318	3.817035074
30	123	0.103	1.38	4.011813819

